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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: POLYPEPTIDE-VACCINES FOR BROAD PROTECTION AGAINST HYPERVIRULENT MENINGOCOCCAL LINEAGES

(57) Abstract: A small number of defined antigens can provide broad protection against meningococcal infection, and the invention provides a composition which, after administration to a subject, is able to induce an antibody response in that subject, wherein the antibody response is bactericidal against two or three of hypervirulent lineages A4, ET 5 and lineage 3 of *N.meningitidis* serogroup B. Rather than consisting of a single antigen, the composition comprises a mixture of 10 or fewer purified antigens, and should not include complex or undefined mixtures of antigens such as outer membrane vesicles. Five protein antigens are used in particular: (1) a 'NadA' protein; (2) a '741' protein; (3) a '936' protein; (4) a '953' protein; and (5) a '287' protein.

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IPC 7 A61K39/095 C07K14/22 A61P31/04

**B. FIELDS SEARCHED**

IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data, MEDLINE, PAJ, EMBASE

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01 64920 A (COMANDUCCI MAURIZIO ;PIZZA MARIAGRAZIA (IT); CHIRON SPA (IT); GALE) 7 September 2001 (2001-09-07) cited in the application page 24	1-3, 16, 17, 19-29
X	WO 01 64922 A (COMANDUCCI MAURIZIO ;PIZZA MARIAGRAZIA (IT); CHIRON SPA (IT); GALE) 7 September 2001 (2001-09-07) cited in the application page 37 page 54	1-3, 16, 17, 19-29
P, X	WO 03 020756 A (PIZZA MARIAGRAZIA ;CHIRON SPA (IT)) 13 March 2003 (2003-03-13) cited in the application page 8	1-3, 16-29

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☒ Further documents are listed in the continuation of box C.

**Y** Patent family members are listed in annex.

• Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
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- \*O\* document referring to an oral disclosure, use, exhibition or other means
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- T** later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principles or theory underlying the invention
- X** document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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- A** document member of the same patent family

Date of the actual completion of the international search

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Wagner, R

# INTERNATIONAL SEARCH REPORT

International Application No  
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	WO 03 010194 A (COMANDUCCI MAURIZIO ;ARICO MARIA (IT); CHIRON SPA (IT)) 6 February 2003 (2003-02-06) cited in the application page 13, line 13	1, 3, 28, 29
X	COMANDUCCI MAURIZIO ET AL: "NadA, a novel vaccine candidate of Neisseria meningitidis" JOURNAL OF EXPERIMENTAL MEDICINE, vol. 195, no. 11, 3 June 2002 (2002-06-03), pages 1445-1454, XP002272871 ISSN: 0022-1007 cited in the application page 1446	30
A	GRIFANTINI RENATA ET AL: "Previously unrecognized vaccine candidates against group B meningococcus identified by DNA microarrays" NATURE BIOTECHNOLOGY, vol. 20, no. 9, September 2002 (2002-09), pages 914-921, XP002272872 ISSN: 1087-0156 the whole document	1-31

# INTERNATIONAL SEARCH REPORT

Intern al application No.  
PCT/IB 03/04848

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  

Although claim 28 is to a method involving a surgical step to be carried out on the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

International Application No  
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